Claims

1. A method of generating a signal principally for use in relation to a non-linear signal path, the method comprising the steps of:

combining an information-bearing signal at a first frequency with an idle frequency at a different frequency to generate a combined signal;

substantially doubling a phase angle of the combined signal to produce a neoteric signal having a second phase angle;

utilising the second phase angle as phase modulation in the neoteric signal; and

ensuring that an envelope of the neoteric signal is substantially constant in level.

2. The method of claim 1, further comprising at least one of the steps of:

passing the combined signal over an internal path; and

applying the neoteric signal to an external path.

3. The method of claim 1 or 2, wherein the idle frequency has an amplitude larger than information-bearing signal.

4. The method of claim 1, 2 or 3, further comprising at least one of the steps of:

a) combining at least one of the information-bearing signal and the idle frequency with a constrained version of one of the combined signal and the neoteric signal; and

b) combining a constrained version of the combined signal with the neoteric signal.

5. The method of any preceding claim, further comprising the step of:

controlling at least one of the phase, amplitude and timing of any one of said signals to compensate for distortion.

6. The method of claim 5, wherein the step of controlling compensates for distortion present within a path used in subsequent communication of the neoteric signal.

7. The method any preceding claim, further comprising the steps of:

determining a level of the information-bearing signal; and

controlling the amplitude of the idle frequency in response to the level of the information-bearing signal.

8. The method of claim 7, wherein the step of controlling the amplitude of the idle frequency is selectable.

9. The method of any preceding claim, wherein formation of the neoteric signal is performed using a digital signal processing technique.

10. A method of generating a neoteric signal comprising the steps of:

a) in a first chain: combining a first information-bearing signal at a first frequency with an idle frequency at a different frequency to produce a first zone signal having a phase angle; and constraining an envelope of the first zone signal to a substantially constant level;

b) in a second chain: providing a second information-bearing signal with the same phase modulation as the first information-bearing signal but said same phase modulation being in an opposite sense and wherein the second information-bearing signal has a central frequency displaced from an idle frequency by an amount equal to a frequency difference between the first information-bearing signal and its idle frequency but in an opposite sense; combining the second information-bearing signal with its idle frequency to generate a first zone signal having a phase angle; and constraining an envelope of the first zone signal of the second chain to a substantially constant level to form an intermediate signal; and

c) taking a frequency difference between the constrained first zone signal of the first chain and the intermediate signal to generate the neoteric signal having a phase angle substantially twice that of the constrained first zone signal and wherein the step of taking the difference effectively cancels AM to PM conversion introduced by processing in both the first chain and the second chain.

11. A method of generating a neoteric signal comprising the steps of:

a) in a first chain: combining a first information-bearing signal at a first frequency with an idle frequency at a different frequency to produce a first zone signal having a phase angle; and constraining an envelope of the first zone signal to a substantially constant level;

b) in a second chain: providing a second information-bearing signal with the same phase modulation as the first information-bearing signal but said same phase modulation being in an opposite sense and wherein the second information-bearing signal has a central frequency displaced from an idle frequency by an amount equal to a frequency difference between the first information-bearing signal and its idle frequency but in an opposite sense; combining the second information-bearing signal with its idle frequency to generate a first zone signal having a phase angle; and constraining an envelope of the first zone signal of the second chain to a substantially constant level to form an intermediate signal; substantially doubling the phase angle of the intermediate signal to produce a second intermediate signal;

c) taking a frequency sum of the constrained first zone signal and the intermediate signal to generate a third intermediate signal and such as to subtract the respective phase angles while adding respectively associated AM to PM conversions; and

d) taking a frequency difference between the third intermediate signal and the second intermediate signal to generate the neoteric signal having a phase angle substantially twice that of the phase angle of the first zone signal and wherein AM to PM conversion introduced by processing in both the first chain

and the second chain are effectively cancelled.

12. The method of claim 10 or 11, further comprising the steps of frequency converting any of said signals so as to render the neoteric signal phase coherent with the information-bearing signal.

13. The method of any one of claims 10, 11 or 12, wherein the step of inverting the phase modulation on the second path to produce a second information-bearing signal further includes the step of converting this signal to a new frequency having a frequency difference from a central frequency of the information-bearing signal and an idle frequency that is twice the frequency difference between the information-bearing signal and the idle frequency in the first path but in an opposite sense.

14. The method of any preceding claim, wherein a frequency difference between central frequencies of the idle frequency and the information-bearing signal is selected such that formation of the neoteric signal results in unwanted signal components that can be separated from a respective one of the information-bearing signal and the narrowband signal.

15. The method of any preceding claim, wherein one of a combination of the information-bearing signal with the idle frequency and the neoteric signal is applied to at least one of an amplifier and a non-linear path.

16. The method of claim 15, wherein a respective one of the amplifier and the non-linear path forms part of an internal path following the combining of the information-bearing signal with the idle frequency.

17. A method of processing a received signal to recover information, the method comprising the steps of:

combining the received signal with an idle frequency having a different

frequency to the received signal to produce a first zone signal having a phase angle;

constraining a signal envelope associated with the first zone signal to a substantially constant level;

substantially doubling the phase angle of the first zone signal to produce a neoteric signal; and

selectively filtering the neoteric signal to recover the information.

18. The method of claim 17, further including the steps of:

at least one of amplifying, changing frequency and signal processing of the first zone signal;

and wherein the step of substantially doubling the phase angle sustains phase modulation of the neoteric signal.

19. The method of claim 18, further including the steps of:

determining a level of the information-bearing signal; and

controlling the amplitude of the idle frequency in response to the level of the information-bearing signal.

20. The method of claim 19, wherein the step of controlling the amplitude of the idle frequency is selectable.

21. The method of any one of claims 17 to 20, further comprising at least one of the steps of:

a) combining at least one of the information-bearing signal and the idle frequency with a constrained version of one of the combined signal and the neoteric signal; and

b) combining a constrained version of the combined signal with the neoteric signal.

22. The method of any one of claims 17 to 21, further comprising the step of:

controlling at least one of the phase, amplitude and timing of any one of said signals to compensate for distortion.

23. Apparatus for generating a neoteric signal from an information-bearing signal at a first frequency, the apparatus comprising:

an idle frequency generator for generating an idle frequency at a different frequency to that of the information-bearing signal;

combining means for combining one of the information-bearing signal with the idle frequency to generate a combined signal;

means for substantially doubling a phase angle of the combined signal to produce the neoteric signal having a second phase angle and in which the second phase angle acts as phase modulation; and

means for ensuring that an envelope of the neoteric signal is substantially constant in level.

24. Apparatus according to claim 23, further including means for applying at least one of the combined signal to an internal path and the neoteric signal to an external path.

25. Apparatus according to claim 23 or 24, wherein a frequency difference between central frequencies of the idle frequency and the information-bearing signal is selected such that formation of the neoteric signal results in unwanted signal components that can be separated from the information-bearing signal.

26. Apparatus according to any one of claims 23, 24 or 25, further including at least one of:

a) means for combining at least one of the information-bearing signal and the idle frequency with a constrained version of the combined signal and the neoteric signal; and

b) means for combining a constrained version of the combined signal with the neoteric signal.

27. Apparatus according to any one of claims 23 to 26, further comprising means of controlling at least one of the phase, amplitude and timing of any one of said signals to compensate for distortion.

28. Apparatus according to claim 27, wherein the means of controlling compensates for distortion present within a path used in subsequent communication of the neoteric signal.

29. Apparatus according to any one of claims 23 to 29, further including:

means for determining a level of the information-bearing signal; and

means for controlling the amplitude of the idle frequency in response to the level of the information-bearing signal.

30. Apparatus according to claim 29, wherein the means for controlling the amplitude of the idle frequency is selectable.

31. Apparatus according to claim 27, wherein at least one of a first phase controller and a first amplitude controller is coupled between the idle frequency generator and a summation unit to regulate the idle frequency.

32. Apparatus according to claim 27 or 31, wherein at least one of a second phase controller and a second amplitude controller is coupled between the information-bearing signal and a summation unit thereby to regulate the information-bearing signal.

33. Apparatus according to claim 26, further including at least one further summation unit located in at least one of the paths of the constrained first zone signal and the neoteric signal, the apparatus further comprising a further means for constraining an output signal from the at least one further summation unit.

34. Apparatus according to claim 33, further comprising at least one of a third phase controller and a third amplitude controller coupled between the constrained first zone signal and the neoteric signal to regulate the constrained first zone signal.

35. Apparatus for generating a neoteric signal from an incident information-bearing signal at a first frequency, the apparatus comprising:

a) an idle frequency generator for generating an idle frequency at a different frequency to that of the information-bearing signal;

b) a first chain having:

means for combining a first information-bearing signal at a first frequency with the idle frequency to produce a first zone signal having a phase angle providing phase modulation; and means for constraining an envelope of the first zone signal to a substantially constant level;

c) a second chain having:

means for providing a second information-bearing signal with the same phase modulation as the first information-bearing signal but said same phase modulation being in an opposite sense and wherein the second information-bearing signal has a central frequency displaced from an idle frequency by an amount equal to a frequency difference between the first information-bearing signal and its idle frequency but in an opposite sense;

means for combining the second information-bearing signal with an idle frequency to generate a first zone signal having a phase angle;

means for constraining an envelope of the first zone signal of the second chain to a substantially constant level to form an intermediate signal; and

d) means for taking a frequency difference between the constrained first zone signal of the first chain and the intermediate signal to generate the neoteric signal having a phase angle substantially twice that of the constrained first zone signal and wherein the step of taking the difference effectively cancels AM to PM conversion introduced by processing in both the first chain and the second chain.

36. Apparatus for generating a neoteric signal from an incident information-bearing signal at a first frequency, the apparatus comprising:

a) a first chain having:

means for combining a first information-bearing signal at a first frequency with an idle frequency at a different frequency to produce a first zone signal having a phase angle; and

means for constraining an envelope of the first zone signal to a substantially constant level;

b) a second chain having:

means for providing a second information-bearing signal with the same phase modulation as the first information-bearing signal but said same phase modulation being in an opposite sense and wherein the second information-bearing signal has a central frequency displaced from an idle frequency by an amount equal to a frequency difference between the first information-bearing signal and its idle frequency but in an opposite sense;

means for combining the second information-bearing signal with an idle frequency to generate a first zone signal having a phase angle; and

means for constraining an envelope of the first zone signal of the second chain to a substantially constant level to form an intermediate signal; substantially doubling the phase angle of the intermediate signal to produce a second intermediate signal;

c) means for taking a frequency sum of the constrained first zone signal and the intermediate signal to generate a third intermediate signal and such as to subtract the respective phase angles while adding respectively associated AM to PM conversions; and

d) means for taking a frequency difference between the third intermediate signal and the second intermediate signal to generate the neoteric signal having a phase angle substantially twice that of the phase angle of the first zone signal and wherein AM to PM conversion introduced by processing in both the first chain and the second chain are effectively cancelled.

37. Apparatus according to claim 35 or 36, wherein the means arranged to invert the phase modulation on the second path to produce a second information-bearing signal further includes means for converting this signal to a new frequency having a frequency difference from a central frequency of the information-bearing signal and an idle frequency that is twice the frequency difference between the information-bearing signal and the idle frequency in the first path but in an opposite sense.

38. The apparatus of any one of claims 35 to 37, further comprising a frequency converter arranged to render the neoteric signal phase coherent with the information-bearing signal.

39. The apparatus of any one of claims 35 to 38, wherein the idle frequency has an amplitude larger than the information-bearing signal.

40. The apparatus of any one of claims 34 to 39, further comprising means for applying one of a combination of the information-bearing signal with the idle frequency and the neoteric signal to at least one of an amplifier and a non-linear path.

41. A receiver arranged to recover information from incident information-bearing signals, the receiver comprising:

means for combining incident information-bearing signals with an idle frequency having a different frequency to the incident information-bearing signals to produce a first zone signal having a phase angle;

a limiter for constraining a signal envelope associated with the first zone signal to a substantially constant level;

means for substantially doubling the phase angle of the first zone signal to produce a neoteric signal; and

a filter for selectively filtering the neoteric signal to recover information.

42. The receiver of claim 41, further comprising means, coupled between the means for substantially doubling and the filter, for frequency converting the resultant signal.

43. The receiver according to claim 41 or 42, wherein a frequency difference between central frequencies of the idle frequency and the information-bearing signal is selected such that formation of the neoteric signal results in unwanted signal components that can be separated from a respective one of the information-bearing signal.

44. The receiver of any one of claims 41 to 43, further comprising at least one of:

a) means for combining at least one of the information-bearing signal and the idle frequency with a constrained version of one of the combined signal and the neoteric signal; and

b) means for combining a constrained version of the combined signal with the neoteric signal.

45. The receiver according to any one of claims 41 to 44, further including means of controlling at least one of the phase, amplitude and timing of any one of said signals to compensate for distortion.

46. The receiver of any one of claims 41 to 45, wherein the means for controlling compensates for distortion present within a path used in subsequent communication of the neoteric signal.

47. The receiver of any one of claims 41 to 46, further comprising:

means for determining a level of the information-bearing signal; and

means for controlling the amplitude of the idle frequency in response to the level of the information-bearing signal.

48. The method of claim 47, wherein the means for controlling the amplitude of the idle frequency is selectable.

49. A method of generating a neoteric signal substantially as hereinbefore described with reference to FIGs. 2 to 14 of the accompanying drawings.

50. A method of processing a received signal substantially as hereinbefore described with reference to FIGs. 2 to 12 of the accompanying drawings.

51. Apparatus for generating a neoteric signal substantially as hereinbefore described with reference to FIGs. 2 to 14 of the accompanying drawings.

52. A receiver substantially as hereinbefore described with reference to FIGs. 2 to 12 of the accompanying drawings.

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